UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,042	01/18/2006	Susumu Kawato	10873.1843USWO	3691

52835 7590 08/11/2008

HAMRE, SCHUMANN, MUELLER & LARSON, P.C.
P.O. BOX 2902
MINNEAPOLIS, MN 55402-0902

EXAMINER	
ZACHARIA, RAMSEY E	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
08/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,042	KAWATO ET AL.	
	Examiner	Art Unit	
	Ramsey Zacharia	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 4-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection. No support could be found in the disclosure as originally filed for a residual rate of a surface electric potential of at least 7% after the electret is allowed to stand at 270 °C for 10 min. While there is support in the originally filed specification for the end point of 78% (as well as 88%), no support could be found for the range of "at least 78%" which encompasses values above the maximum disclosed value of 88%.

Claim Rejections - 35 USC § 103

4. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodera et al. (US 4,014,091) in view of Felix et al. (US 5,589,558).

Kodera et al. teach an electret transducer formed from a resin sheet, such as a polytetrafluoroethylene sheet, adhered to a backplate (column 1, lines 47-61). The backplate may be made of metal, such as aluminum (column 4, lines 44-49).

Kodera et al. do not teach that the resin sheet is a modified polytetrafluoroethylene. However, Kodera et al. do teach the use of polytetrafluoroethylene as the resin sheet.

Felix et al. teach a polytetrafluoroethylene modified with 0.02-1 wt% of a perfluoroalkyl vinyl ether (abstract). The modification results in a polymer having improved dielectric strength (column 1, lines 41-48).

One skilled in the art would be motivated to use the modified polytetrafluoroethylene as the resin sheet in Kodera et al. because it has improved dielectric strength which will result in an improved electret transducer.

The polytetrafluoroethylene taught by Felix et al. (i.e. polytetrafluoroethylene modified with 0.02-1 wt% of a perfluoroalkyl vinyl ether) should intrinsically possess a residual rate of a surface electric potential after being allowed to stand at 270 °C for 10 minutes of at least 78%. According to the instant specification, PTFE modified with 0.001 to 1.0 mol% of perfluorovinyl ether partially deforms the base crystals of the PTFE with the result that electric charges can be retained more easily (see page 4, lines 11-19). Since the polytetrafluoroethylene taught by Felix et al. has a perfluorovinyl ether content that is completely within the preferred range disclosed by the applicants, it would be expected to possess the same electrical retention properties. Further support for this position can be found in Examples A1 and Comparative Examples A5 in the instant specification. The polymer in Example A1 (PTFE with 0.1 mol% of perfluorovinyl ether) has a comonomer content within the range disclosed by Felix et al. and possesses a residual rate

that meets the limitations of claim 4. Conversely, the polymer in Comparative Example A5 (PTFE with 3 mol% of perfluorovinyl ether) has a comonomer content that is outside the range disclosed by Felix et al. and possesses a residual rate that does not meet the limitations of claim 4. Moreover, the limitations of claim 6 are taken to be met since dielectric constant and volume resistivity are material properties and the material of Felix et al. appears to be the same as the modified polytetrafluoroethylene of the instant application.

5. Claims 9-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kodera et al. (US 4,014,091) in view of Kang et al. (US 6,334,926).

Kodera et al. teach an electret transducer formed from a resin sheet, such as a polytetrafluoroethylene sheet, adhered to a backplate at a temperature of 280-400 °C (column 1, lines 47-61). The backplate may be made of metal, such as aluminum (column 4, lines 44-49).

Kodera et al. teach neither the water contact angle of the surface of the resin sheet bonded to the metal plate nor that the surface of the resin sheet is subjected to an adhesion-improving treatment.

Kang et al. teach a method for low temperature lamination of a metal to the surface of a fluoropolymer (column 1, lines 8-13). The method comprises subjecting the surface of the fluoropolymer to be bonded to the metal with a plasma pretreatment (column 2, line 55-column 3, line 4). Monomers containing imidazole, epoxide, anionic, cationic or amphoteric functional groups are then surface grafted onto the pretreated surface (column 4, lines 25-33). The embodiments of the Examples illustrates that pretreatment allows for lamination at a temperature of 120 °C while still resulting in peel strengths of 6-9 N/cm.

One skilled in the art would be motivated to subject the surface of the resin sheet of Kodera et al. to the treatment regimen of Kang et al. to enable resin sheet and backplate to be bonded together at a lower temperature, thus reducing operating costs.

Regarding the limitation directed to the contact angle of water in claim 9, this limitation is taken to be met since imidazole, epoxide, anioninc, cationic or amphoteric functional groups are polar in nature. Thus, grafting such groups onto the surface of polytetrafluoroethylene would be expected to lower the contact angle of water since water is also polar and would be expected to wet a surface having polar groups grafted thereon. Moreover, since the grafting occurs on the polymer surface at the interface with the selected metal (see column 2, lines 59-65 of Kang et al.) the surface that is not in contact with the metal (i.e. the exposed surface) would be expected to not have a contact angle that has not been lowered. An unaltered PTFE surface would be expected to intrinsically possess a water contact angle of not less than 111° (see Examples B1 to B5 in the instant specification).

The limitations of claims 11 and 17 are taken to be met since dielectric constant and volume resistivity are material properties and the material of Kodera et al. (polytetrafluoroethylene) appears to be the same as the polytetrafluoroethylene of the instant claims 9-19.

Response to Arguments

6. Applicant's arguments filed 12 May 2008 have been fully considered but they are not persuasive.

Regarding the rejection over Kodera et al. in view of Felix et al., the applicants argue that Felix et al. does not teach or suggest the use of modified PTFE to improve charge retention ability but rather to improve dielectric strength and discoloration problems without providing any correlation between dielectric strength and charge retention ability. The applicants further argue that comparative examples A4, A5, A9, and A10 demonstrate that modified PTFE does not inherently provide the charge retention ability of claim 4.

This is not persuasive for the following reasons. The charge retention characteristic recited in claim 4 appears to be a material property of the modified PTFE used. According to the instant specification, PTFE modified with 0.001 to 1.0 mol% of perfluorovinyl ether partially deforms the base crystals of the PTFE with the result that electric charges can be retained more easily (see page 4, lines 11-19). Since the polytetrafluoroethylene taught by Felix et al. has a perfluorovinyl ether content that is completely within the preferred range disclosed by the applicants, it would be expected to possess the same electrical retention properties. The mere recognition of a latent property in the prior art does not render nonobvious an otherwise known invention.

Moreover, the Examples presented in the specification support the position that the PTFE of Felix et al. would intrinsically possess electrical retention properties that meet the limitations of claim 4. Comparative Examples A4 and A9 are directed to FEP, a copolymer of tetrafluoroethylene and hexafluoropropylene that is not representative of the modified PTFE of Felix et al. (i.e. PTFE modified with 0.02-1 wt% of a perfluoroalkyl vinyl ether). Likewise Comparative Examples A5 and A10 are directed to PFA, a copolymer of tetrafluoroethylene and 3 mol% of a perfluorovinyl ether that is also not representative of the modified PTFE of Felix et

al. Conversely, the polymer of Examples A1 and A2, PTFE modified with 0.1 mol% of perfluorovinyl ether, is in the middle of the 0.001 to 1.0 mol% range taught by Felix et al. and possesses electrical retention properties that meet the limitations of claim 4.

Regarding the rejection over Kodera et al. in view of Kang et al., the applicants argue that neither Kodera et al. nor Kang et al. disclose or suggest the adhesion-improving treatment on only the surface facing the metal member. The applicants allege that Kang et al. suggests that the films receive the plasma pre-treatment on both sides on the fluoropolymer surfaces, citing column 3, lines 56-61 and Examples 1-8 of Kang et al. for support.

This is not persuasive for the following reasons. First, Kang et al. explicitly teach that the method for the modification of their fluoropolymer comprises plasma pretreatment then thermal graft copolymerization "at the lapped interface between the fluoropolymer and the selected metal" (see column 2, lines 59-65). In the embodiments of the examples, assemblies were constructed comprises the graft monomer disposed between PTFE and copper layers which were then sandwiched between stainless steel blocks. That is, the surface of the PTFE opposite the copper layer is not treated with graft monomer but rather is in contact with, and covered up by, a stainless steel block. Second, since the treatment of Kang et al. is intended to improve the adhesion between fluoropolymer and metal surfaces, there would be no reason or motivation for one skilled in the art to apply the treatment to any fluoropolymer surface that was not to be adhered to a metal surface.

Therefore, because (1) there is an express teaching to apply the treatment to the lapped interface, (2) there is no teaching to apply the treatment to the surface of the fluoropolymer that is opposite the fluoropolymer/metal interface, and (3) there is no motivation to apply an adhesion

promoting treatment to a surface that is not subject to bonding, the applicants arguments are not persuasive and the rejection is maintained.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramsey Zacharia whose telephone number is (571) 272-1518. The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye, can be reached at (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ramsey Zacharia/

Primary Examiner, Art Unit 1794